

**Harry B. Wilson, OSB #077214**

HarryWilson@MarkowitzHerbold.com

**Hannah K. Hoffman, OSB #183641**

HannahHoffman@MarkowitzHerbold.com

**MARKOWITZ HERBOLD PC**

1455 SW Broadway, Suite 1900

Portland, OR 97201-3412

(503) 295-3085

Special Assistant Attorneys General for Defendants

**Ellen F. Rosenblum, OSB #753239**

Attorney General

**Brian Simmonds Marshall, OSB #196129**

Senior Assistant Attorney General

Brian.S.Marshall@doj.state.or.us

**DEPARTMENT OF JUSTICE**

100 SW Market Street

Portland, OR 97201

(971) 673-1880

Attorneys for Defendants

UNITED STATES DISTRICT COURT

DISTRICT OF OREGON

PENDLETON DIVISION

OREGON FIREARMS FEDERATION, INC.,  
et al.,

Plaintiffs,

v.

TINA KOTEK, et al.,

Defendants,

and

OREGON ALLIANCE FOR GUN SAFETY,

Intervenor-Defendant.

Case No. 2:22-cv-01815-IM (lead case)  
3:22-cv-01859-IM (trailing case)  
3:22-cv-01862-IM (trailing case)  
3:22-cv-01869-IM (trailing case)

**DECLARATION OF KEVIN SWEENEY**

MARK FITZ, et al.,

Plaintiffs,

v.

ELLEN F. ROSENBLUM, et al.,

Defendants.

KATERINA B. EYRE, et al.,

Plaintiffs,

v.

ELLEN F. ROSENBLUM, et al.,

Defendants,

and

OREGON ALLIANCE FOR GUN SAFETY,

Intervenor-Defendant.

DANIEL AZZOPARDI, et al.,

Plaintiffs,

v.

ELLEN F. ROSENBLUM, et al.,

Defendants.

**DECLARATION OF KEVIN M. SWEENEY**

I, Kevin M. Sweeney, declare the following:

1. I am over the age of eighteen (18) years, competent to testify to the matters contained in this declaration, and testify based on my personal knowledge and information.

2. I am a Professor of History *emeritus* at Amherst College. From 1989 to 2016, I taught history and American Studies at Amherst. I regularly offered courses on colonial American history, the era of the American Revolution, and early American material culture, which focused on studying the production and use of home furnishings and other artifacts in common use

dating from the 1600s, 1700s, and early 1800s. During these years, in my own research on material culture, I made use of colonial-era probate inventories to study such topics as home furnishings in an effort to discover what types of possession were commonly found in households, to measure changes in standards of living, and to gain insights into domestic architecture.<sup>1</sup> I also examined critically and wrote about the strengths and weaknesses of these sources, their usefulness and pitfalls.<sup>2</sup> For decades, historians who are aware of these records' usefulness and their limitations have used estate inventories to study agricultural changes in England, wealth and social structures in England and its colonies, the institution of slavery in colonial American and the lives of slaves, and household possessions in America, England, and France.<sup>3</sup>

3. My current research on seventeenth and eighteenth-century firearms and militias utilizes similar types of methodologies, documentary sources, and period artifacts. This project, which has been going on for over a decade, was initially inspired by my skepticism of the controversial claims and pretended use of evidence from probate inventories in Michael A. Bellesiles, *Arming America: The Origins of a National Gun Culture* (New York: Alfred A. Knopf, 2000). As part of my on-going project, I have given papers at the annual meetings of the American Historical Association and the Organization of American Historians, at conferences on firearms and society at Stanford and Wesleyan Universities, and elsewhere, and published two essays “Firearms Militias, and the Second Amendment” (2013) and “Firearms Ownership and

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<sup>1</sup> Kevin M. Sweeney, “Furniture and the Domestic Environment in Wethersfield, Connecticut, 1640-1800 in *Material Life in America, 1600-1860*, Robert B. St. George, editor (Boston: Northeastern University Press, 1988), 261-261-290.

<sup>2</sup> Kevin M. Sweeney, “Using Tax Lists to Detect Biases in Probate Inventories,” *Early American Probate Inventories: Dublin Seminar for New England Folklife Annual Proceedings 1987*, Peter Benes, editor (Boston: Boston University Press, 1989), 32-40.

<sup>3</sup> Some notable examples which also contain informed observations on the use of probate inventories, their biases, and how to deal with the biases see: James Horn, *Adapting to a New World: English Society in the Seventeenth-Century Chesapeake* (Chapel Hill: University of North Carolina Press, 1994); Gloria L. Main, *Tobacco Colony: Life in Early Maryland, 1650-1720* (Princeton: Princeton University Press, 1982), esp. 49, 282-286; Philip D. Morgan, *Slave Counterpoint: Black Culture in the Eighteenth-Century Chesapeake & Lowcountry* (Chapel Hill: University of North Carolina Press, 1998); Carole Shammas, *The Pre-Industrial Consumer in England and America* (Oxford: Oxford University Press, 1990), esp. 19-20; Lorna Weatherill, *Consumer Behaviour & Material Culture in Britain 1660-1760*, 2nd. ed. (London: Routledge, 1996), esp. 201-207.

Militias in Seventeenth- and Eighteenth-Century England and America” (2019). A third essay is forthcoming on “Revolutionary State Militias in the Backcountry and Along the Frontiers,” and I am currently working on a fourth essay as well as working on a book-length manuscript. My curriculum vitae, detailing my education, experience, and publications, is attached to this declaration as **Exhibit A**.

4. I have been retained by the State of Oregon Defendants to provide an expert opinion on repeating firearms in eighteenth-century America. I make this declaration on the basis of my training, professional expertise, and research. For my work in this case, I am being compensated at a rate of \$50 per hour.

5. During the 1700s, most gun owners in the British American colonies and in the newly independent republic of the United States possessed and used single shot, muzzle-loading, flintlock firearms. As Harold Peterson stated in his classic 1956 book -- *Arms and Armor in Colonial America, 1526-1783*:“The period began in 1689 with the muzzle-loading smooth-bore musket and pistol as the most popular weapons. In 1783, almost a hundred years later, the period ended with the same weapons [i.e. muzzle-loading smooth-bore muskets and pistols] still supreme, and without even any notable improvements in their design or construction.”<sup>4</sup> Peterson continued: “Breech-loaders and repeaters had appeared frequently on the scene but had made little impression upon it.”<sup>5</sup>

6. Evidence compiled during a decade of research using eighteenth-century probate inventories, militia muster lists, newspapers, and other documentary sources confirms the validity of Peterson’s basic conclusions while offering three minor modifications. First, these weapons described by Peterson [i.e., the muzzle-loading smooth-bore musket and pistol] were still “supreme” in 1800 and probably as late as 1810. Second, most muzzle-loading, flintlock long arms that were privately owned and used during this period were not muskets, but lighter firearms that were usually cheaper and had narrower bores than did muskets. Finally, it is more accurate to

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<sup>4</sup> Harold L. Peterson, *Arms and Armor in Colonial America 1526-1783* (Harrisburg, Penn.: Stackpole Publishing 1956), 221.

<sup>5</sup> *Ibid.*, 221.

say that repeaters had *occasionally* appeared on the scene and not “frequently” as Peterson believed. Here, he was probably misled by the preference that private collectors and institutional collections had (and still have) for obtaining rare examples of unusual or innovative firearms.

## I. Firearms Owned By Eighteenth-Century Americans

7. Today, we tend to refer to any muzzle-loading eighteenth-century gun as a musket, and this is what Peterson did in the statement quoted above. However, Peterson knew better, as did Ben Franklin. In the mid-1740s, Franklin informed the readers of his Philadelphia newspaper that a “Musket” was “the Name of a particular Kind of Gun.”<sup>6</sup> An eighteenth-century musket was a sturdy, muzzle-loading military firearm that fired a single lead ball weighing about an ounce, had a sling for ease of carrying on long marches, and had a lug near the muzzle for attaching a bayonet. It weighed about 10 to 11 pounds and was .69 caliber in its bore if French or .75 caliber if English, with an average barrel length of 44 inches.<sup>7</sup> On a battlefield, a musket was more than just a firearm: because of its weight and sturdy construction and because of its bayonet, a musket also functioned as a club and a spear. These capabilities were integral to its role as an eighteenth-century military arm. The combination of these features and capabilities made a musket “a Universal Weapon.”<sup>8</sup>

8. Eighteenth-century muskets did have two serious drawbacks which they shared with all flintlock, muzzle-loading smoothbores. First, their accuracy and range were limited. The round ball fired by these weapons was not very aerodynamic, and this produced a great deal of drag that reduced its velocity. A musket’s smooth-bore barrel also lacked rifling, which were spiral grooves cut inside the barrel. When a ball traveled down a barrel with rifling, the grooves imparted a spin to the ball that stabilized and flattened its trajectory, increasing its distance and accuracy. (The effect of rifling on a rifle ball’s flight can be compared to throwing a spiral pass

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<sup>6</sup> “Form of Association” in *The Papers of Benjamin Franklin*, ed., Leonard W. Labaree, et al., 40 volumes to date (New Haven: Yale University Press, 1959-), Vol. 3, 208.

<sup>7</sup> Author’s estimate of barrel averages calculated from data found in George C. Neumann, *Battle Weapons of the American Revolution*, (Texarkana, Texas: Scurlock, 1998), 121-141.

<sup>8</sup> Stuart Reid, *The Flintlock Musket: Brown Bess and Charleville 1715-1865*(Oxford: Osprey, 2016), 61, 55-60.

in football which also flattens trajectory and improves accuracy.) While a smooth-bore musket may have been just as accurate as an eighteenth-century muzzle-loading rifle at distances of up to 50 yards, most authorities agree that a musket was not very accurate at ranges beyond 100 yards.<sup>9</sup> Today, pistols and most long arms other than shotguns have rifled barrels.

9. Loading and reloading eighteenth-century muskets was a complicated and relatively slow process by today's standards. To load a musket, a shooter held it in front of him parallel to the ground, pulled back the gun's cock to its half cock position to prevent a premature discharge, and then took from a cartridge box an individual paper cartridge that contained a pre-measured load of gunpowder and a ball. Next one opened the priming pan, bit the cartridge and poured a small amount of powder into the priming pan which was then closed shut. Following this, the shooter placed the musket upright on the ground and poured the remainder of the cartridge's gun powder down the barrel, and then crammed the paper cartridge with its ball into the barrel. (The cartridge's paper wrapper served as wadding, holding the ball in place.) A ramrod was used to push the cartridge paper and ball down the barrel, after which the ramrod was recovered and secured in its resting place under the barrel. The musket was then raised, placed on full cock, aimed, and the trigger pulled. Pulling the trigger released the cock, which held a flint that moved forward, striking a steel frizzen, creating sparks that ignited the powder in the priming pan which in turn ignited the charge of powder placed in the barrel, creating an explosion that—finally—discharged the musket ball. As a rule, a musket could realistically be loaded and fired two or three times a minute in combat by well-equipped and trained soldiers.<sup>10</sup>

10. The process of loading and reloading a musket took even longer if instead of using a prepared paper cartridge, one used gunpowder from a powder horn to prime the pan and

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<sup>9</sup> Reid, *Flintlock Musket*, 34. For a claim that a rifle had an advantage over a musket at distances greater than 50 yards see John F. Winkler, *Point Pleasant, 1774: Prelude to the American Revolution* (Oxford: Osprey, 2014), 29. For a claim that a rifle and a musket were equally accurate at 100 yards see Alexander Rose, *American Rifle, A Biography* (New York: Delta Trade Paperbacks, 2009), 20.

<sup>10</sup> Jeremy Black, *European Warfare, 1660-1815* (New Haven: Yale University Press, 1994), 40; Hew Strachan, *European Armies and the Conduct of War* (London: George Allen & Unwin, 1983), 17.

then poured into the horn's measuring cap the amount of powder needed to charge the barrel. With this procedure one also had to remove an individual musket ball from a shot pouch and place it in the barrel after pouring down the measured charge of powder. The ball was then rammed home. Using this method of loading not only took longer, but also lacked the wadding provided by a paper cartridge which helped hold the ball in place. According to the results of one modern test, wadding also increased a smoothbore's muzzle velocity by about 30%.<sup>11</sup> Most hunters, backwoods men with muzzle-loading rifles, and many colonial militiamen lacked cartridge boxes and paper cartridges and instead used powder horns and shot bags.

11. Even with these drawbacks, colonial governments and later state governments armed troops with these muskets during the French and Indian War (1754-1763) and the Revolutionary War (1775-1783). There really weren't serious alternatives. As a result, the British Ordnance Office loaned colonial governments 22,000 muskets to arm provincial troops raised for active service in the field during the French and Indian War, and at least 100,000 European muskets—most of them French—were imported during the American War for Independence.<sup>12</sup> During the French and Indian War, the British also sent muskets to arm Georgia and North Carolina militiamen who lacked arms, and state governments sometimes provided arms for mobilized militiamen during the Revolutionary War.<sup>13</sup>

12. As a rule, American colonists preferred lighter firearms that were better suited than muskets for pest control, birding, or hunting. Especially popular in New England were locally made or imported smoothbore and fusils that weighed only 6 to 7 pounds and had narrower bores of .60 to .65 caliber, with average barrel lengths of 50 inches.<sup>14</sup> The narrower

<sup>11</sup> Glenn Foard, *Battlefield Archaeology of the English Civil War* British Series 570 (Oxford: British Archaeological Reports, 2012), 105.

<sup>12</sup> De Witt Bailey, *Small Arms of the British Forces in America 1664-1815* (Woonsocket, R.I.: Mowbray, 2009), 120-123; George D. Moller, *American Military Shoulder Arms*, 2 volumes (Albuquerque, N.M., 2011), Vol. 1, Appendix 5, 484-485.

<sup>13</sup> Kevin M. Sweeney, "Firearms, Militias, and the Second Amendment" in Saul Cornell and Nathan Kozuskanich, eds. *The Second Amendment on Trial: Critical Essays on District of Columbia v. Heller* (Amherst: University of Massachusetts Press, 2013), 335, 348, 351-352.

<sup>14</sup> Author's estimate of barrel averages calculated from data found in Neumann, *Battle Weapons of the American Revolution*, 150-166.

bores used smaller and lighter projectiles, required less powder for each shot, and thus reduced the weight of the lead ammunition one carried.<sup>15</sup> Some New England fowlers could outrange muskets and some were modified to carry a bayonet.<sup>16</sup> However, because of their lighter weights and sleeker construction, they were not necessarily as sturdy or as “soldier-proof” as a musket nor as effective as a club.

13. Many residents living in the colonies stretching from New York to Virginia owned “trade guns.” These were inexpensive, muzzle-loading, single shot, smooth-bore firearms designed and produced for trade with Native Americans. Some of these guns weighed as little as 5.5 pounds, had bores of .57 to .62 caliber, and barrels only 36 to 40 inches long.<sup>17</sup> Because of these features, they were much easier to handle than a musket and employed about half the weight of lead and powder than compared to a musket for each shot. However, these light, often cheaply constructed firearms did not function well as clubs and were not designed to carry a bayonet.

14. In the backcountry of Pennsylvania and the colonies further south there was a distinct minority of men who owned more expensive locally made long rifles. As a rule, these firearms weighed from 7 to 8 pounds, had .58 to .62 caliber bores—though some were even smaller—and barrels averaging 42 inches in length, and fired projectiles weighing much less than musket balls.<sup>18</sup> Because of the barrel’s rifling, these guns were more accurate than smoothbore muskets and outranged them. However, they took more time to reload because riflemen had to use powder horns and bullet pouches instead of paper cartridges, and reloading became harder as

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<sup>15</sup> Steven C. Eames, *Rustic Warriors: Warfare and the Provincial Soldier on the New England Frontier, 1689-1748* (New York: New York University Press, 2011), 121-122; Neumann, *Battle Weapons of the American Revolution*, 206-210.

<sup>16</sup> Douglas D. Scott, et al., “Colonial Era Firearm Bullet Performance: Live Fire Experimental Study for Archaeological Interpretation” (April 2017), 26, 36; Tom Grinslade, *Flintlock Fowlers: The First Guns Made in America* (Texarkana, Texas: Scurlock Publishing 2005), 59, 72, 73, 75.

<sup>17</sup> M. L. Brown, *Firearms in Colonial America: The Impact on History and Technology 1497-1792* (Washington, D.C.: Smithsonian Institution Press, 1980), 283; Neumann, *Battle Weapons of the American Revolution*, 203-205.

<sup>18</sup> Author’s estimate of barrel averages calculated from barrels lengths of individual muskets given in Neumann, *Battle Weapons of the American Revolution*, 215-225.

gunpowder residue built up in the grooves of the barrel's rifling.<sup>19</sup> Additionally, these long rifles were not designed to take a bayonet, and they could break if used as a club.

15. Muzzle-loading pistols were not as popular as long arms which—as experts have pointed out—“could economically be used dually for protection and hunting.”<sup>20</sup> Pistols were therefore found in only a minority of eighteenth-century probate inventories (Table 1). It took about 15 seconds to reload a pistol, and as a result, they were often made in pairs “so that the owner might have two shots at his command.”<sup>21</sup> Instead of taking time to reload a pistol on a battlefield, cavalry troopers used discharged pistols as clubs or threw them at enemy cavalrymen.<sup>22</sup> As it was, period pistols were discharged in close proximity to their targets because their low muzzle velocity of 330-440 f/s limited the range and impact of their projectiles. By comparison, muzzle velocities produced by reproductions of eighteenth-century muskets (780 f/s to 870 f/s), fowlers (1160 f/s to 1444 f/s) and rifles (1195 f/s to 1320 f/s) are much higher.<sup>23</sup>

16. Civilian officials and military officers generally had a low opinion of trade guns, fowlers and even the period’s American-made long rifles. During the French and Indian War, firearms in use in New Hampshire were said to be “in general of the meanest Sort” while those in Connecticut “which belong to private persons [were] mostly poor and undersized and unfit for an expedition.”<sup>24</sup> In 1756, most of New York’s militia were armed with guns “chiefly for the Indian

<sup>19</sup> John W. Wright, “The rifle in the American Revolution,” *American Historical Review* Vol. 29, No. 2 (January 1924), 293-299.

<sup>20</sup> Jeff Kinard, *Pistols: An Illustrated History of their Impact* (Santa Barbara, CA: ABC-CLIO, 2004), 45.

<sup>21</sup> Harold L. Peterson, *Treasury of the Gun* (New York: Golden Press, 1962), 189.

<sup>22</sup> For use of muzzle-loading pistols as clubs and missiles on battlefields see C. H. Firth, *Cromwell’s Army* 2<sup>nd</sup> ed. (Oxford: Oxford University Press, 1911), 142; David Blackmore, *Arms & Armour of the English Civil Wars* (London: Royal Armouries, 1990), 49.

<sup>23</sup> Scott, et al., “Colonial Era Firearm Bullet Performance,” 26, 36; Douglas D. Scott, et al. “Firearm Bullet Performance: Phase II, Live Fire Experimental Study for Archaeological Interpretation,” 31. Both reports are available online.

<sup>24</sup> “Blair Report on the State of the Colonies” in Louis K. Koontz, *The Virginia Frontier, 1754-1763* (Baltimore: The Johns Hopkins Press, 1925), 170, hereafter cited as the “Blair Report”; Governor Thomas Fitch to Sir Thomas Robinson, August 1, 1755 in *Collections of the Connecticut Historical Society*, Vol. 1, 265-266.

Trade,” and not muskets.<sup>25</sup> Later, George Washington referred to such smooth-bore long arms as “trash or light arms.”<sup>26</sup> Over the course of the Revolutionary War, he and his officers even phased out the use of rifles in the Continental Army, rearming soldiers with muskets fitted with bayonets.<sup>27</sup> Governor Thomas Jefferson characterized most of the privately owned smoothbore guns carried by his state’s militiamen as “such firelocks [i.e. flintlocks] as they had provided to destroy noxious animals which infest their farms.”<sup>28</sup>

17. Data drawn from group of probate inventories of males who died during the second half of the eighteenth-century confirm these period observations concerning the preferences of American gun owners (Table 1). These sources can be particularly useful and quite reliable for assessing the preferences of period gunowners for different types of firearms. Even cursory descriptions of firearms as “a gun” can be revealing when combined with the price that individuals taking the inventory assigned. Most guns in the inventory were long arms valued at £1 (i.e. 20 shillings), which was the usual cost of a single shot muzzle loading firearm. Such weapons would have been affordable given the fact that a daily wage during the period for unskilled day labor usually varied between 1 and a half and 2 shillings. While there was an obvious preference for long arms, muskets and rifles constituted a minority of such weapons.

18. The more expensive guns found in these 3,249 eighteenth-century probate inventories were also likely to be some type of muzzle loading, single-shot long arms. As a rule, rifles were valued at £2 to £3, which was twice or three times the cost of common muzzle-loading smoothbore long arms. Expensive smoothbore weapons were likely to be imported fowlers or guns ornamented with silver mountings. Occasionally, one sees double barreled guns which, along with a pair of pistols, was the period’s more realistic provision for being able to

<sup>25</sup> “Blair Report,” 171.

<sup>26</sup> General George Washington to Gentlemen, Feb. 7, 1777 in Nathaniel Bouton, ed., *Documents and Records Relating to the State of New Hampshire during the Period of the Revolution from 1776 to 1783* (Concord, N.H.: Edward A. Jenks, State Printer, 1874), Vol. 8, 485.

<sup>27</sup> Wright, “Rifle in the American Revolution,” 297-298.

<sup>28</sup> Thomas Jefferson, *Notes on the State of Virginia*, edited by William Peden (New York: W. W. Norton, 1982), 88.

readily discharge more than one shot. Only one gun found in this database of 3,249 probate inventories may have been a repeater: an “air gun” owned by Philippe Guillaume Chion [Philip Williamson?], Charleston merchant, who died in 1797.<sup>29</sup> However, as is noted below in paragraph 40, not all air guns available in America were repeaters.

**Table 1: Firearms in Probate Inventories of Male Decedents Filed between 1740-1800**

Region	Number of Sampled Male Inventories	Percentage of Inventories with Firearms	Percentage of Inventories with Muskets	Percentage of Inventories with Rifles	Percentage of Inventories with Pistols
New England 1740-1798	1057	46.1%	0.8%	0.0%	2.8%
New York and New Jersey 1740-1798	569	35.0%	1.9%	0.5%	5.8%
Pennsylvania 1740-1797	532	32.0%	0.2%	2.3%	5.1%
Maryland and Virginia 1740-1797	632	58.4%	1.3%	5.1%	9.0%
South Carolina 1740-1797	459	62.9%	3.7%	4.1%	23.3%
Totals	3249	46.6%*	1.4%*	2.0%*	7.8%*

Note: \*The percentages at the bottoms of the columns are not averages of the percentages in the columns, but percentages of the total of 3249 inventories found in each category: 1514 inventories with firearms, 45 inventories with muskets, 66 inventories with rifles and 254 inventories with pistols. Sources: The sources for the probate inventories used in this table are listed in Kevin M. Sweeney, “Firearms Ownership and Militias in Seventeenth- and Eighteenth-Century England and America” in Jennifer Tucker, Barton C. Hacker, and Margaret Vining, eds., *A Right to Bear Arms? The Contested History in Contemporary Debates on the Second Amendment* (Washington, D.C.: Smithsonian Press, 2019), 70-71.

19. Partial militia returns from the state of Virginia dating from 1781 to 1784 provide additional evidence that American consumers preferred smoothbore firearms that were not muskets. Even though state law required “every militia-man to provide himself with arms [i.e. muskets] usual in regular service [i.e. the Continental Army] . . . this injunction was always in

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<sup>29</sup> Inventory of Philippe Guillaume Choin, 1797, South Carolina Inventories and Appraisement Books, Vol. C, 1793-1800, 212-213. at Fold 3 by Ancestry <https://www.fold3.com/publication/700/south-carolina-estate-inventories-and-bills-of-sale-1732-1872>. <Accessed online 1/23/2023 at 6:00 P.M.>

differently complied with.<sup>30</sup> Most did not own muskets, even in wartime. Only about 16.7% of the privately owned long arms were muskets, while another 20.3% were rifles owned by residents of the state's western counties.<sup>31</sup> By contrast, 63.0% of the privately owned long arms were smoothbores that were not muskets.<sup>32</sup>

**Table 2: Partial Virginia Militia Returns Indicating Types of Arms in Use, 1781-1784**

Year	Number of Counties	Number of public muskets	Number of private muskets	Number of private long arms*	Number of private rifles	Number of private pistols	Total Number of Guns
1781	27	1502	1333	4225	1293	204	8557
1782	10	565	242	2113	767	60	3747
1784	15	541	441	1260	392	68	2702
ALL	52	2608	2016	7598	2452	332	15006

**Note:** \*Number of “private long arms” are privately owned long arms that were not muskets and not rifles.

**Sources:** Militia Returns 1777-1784, microfilm, Accession 36929; State Government Records Collection; “General Return of Arms, Accoutrements, and Military Stores, 19<sup>th</sup> May, 1784,” Accession 36912, House of Delegates, Executive Communications, Library of Virginia, Richmond

20. A large portion of the firearms used in eighteenth-century America would have been imported from England. At the time, most English firearms were fabricated by large-scale putting-out systems that obtained barrels from one set of suppliers, got gunlocks from other sources, and assembled the parts at yet another site where the firearms also would have been stocked by craftsmen who were woodworkers. By the mid-eighteenth-century, gun manufacturing in Birmingham, England involved “at least thirty different ‘sub-trades’ or manual

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<sup>30</sup> Jefferson, *Notes on the State of Virginia*, 88.

<sup>31</sup> Calculated from data in Table 2.

<sup>32</sup> *Ibid.*

manufacturing processes.”<sup>33</sup> In particular, this is how firearms were made for the British army and for the export trade to Africa and England’s colonies.<sup>34</sup>

21. Other than American long rifles and some New England fowlers, most eighteenth-century firearms used by colonists were not likely to have been custom made or “one-off” products. During the years from 1756 to 1763, at least 36,592 firearms were imported into the thirteen American colonies from England for civilian customers.<sup>35</sup> Another 18,900 trade guns were imported to sell to Native American customers.<sup>36</sup> Advertisements indicate that urban gunsmiths in the colonies sold imported firearms and made use of imported gunlocks and barrels. Most of the pistols sold in the colonies were not produced in the colonies.<sup>37</sup> A rare surviving account book of an inland gunsmith, John Partridge Bull of Deerfield, indicates that he made only three new guns over a period of 20 years from 1768 to 1788, while performing 452 repairs on existing firearms.<sup>38</sup> When it came to his gunsmithing business, this skilled craftsman may have had more in common with a twentieth-century TV repairman than he did with Samuel Colt or Eli Whitney.

## **II. References to Repeating Arms in Eighteenth-Century Media**

22. So, how common were repeating weapons in eighteenth-century America? The short answer is not very common; they were in fact extraordinarily rare. Information drawn from eighteenth-century advertisements and news reports found in *America’s Historical Newspapers*—a searchable database of 5,000 newspapers, with 450 dating from before 1800—tells much the same story.<sup>39</sup> This newspaper database was searched by entering the terms “gun,”

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<sup>33</sup> David Williams, *The Birmingham Gun Trade* (Stroud, Gloucestershire, Eng.: The History Press, 2009), 21.

<sup>34</sup> Williams, *Birmingham Gun Trade*, 21-24; De Witt Bailey, *Small Arms of the British Forces in America 1664-1815* (Woonsocket, R.I: Andrew Mowbrey, 2009), 93-102.

<sup>35</sup> Bailey, *Small Arms*, 237.

<sup>36</sup> De Witt Bailey, “The Wilson Gunmakers to Empire, 1730-1832” American Society of Arms Collectors *Bulletin* No. 85, 19.

<sup>37</sup> Jeff Kinard, *Pistols: An Illustrated History of Their Impact* (Santa Barbara: ABC-CLIO, 2003), 46.

<sup>38</sup> Susan McGowan, “Agreeable to his Genuis: John Partridge Bull (1731-1813), Deerfield, Massachusetts” (M.A. thesis, Trinity College, 1988), 5, 39-40, 74-75.

<sup>39</sup> *America’s Historical Newspapers* (Chester, VT: Readex, 2004).

“musket,” “fowler,” “rifle,” “pistol,” “shot” and “militia.” The search turned up 9 references to what appear to be repeating guns. To the information discovered by searching period newspapers can be added one more well-known instance of an unpublicized demonstration of a repeating firearm that took place in Philadelphia in April of 1777. This makes a total of 10 references to eighteenth-century repeaters in the period from 1720 to 1800.

23. What do these period references to repeating guns tell us about their features and how they were employed, how they were regarded, and why they remained relatively uncommon in eighteenth-century America? The earliest known reference in an American newspaper to a repeating firearm is reported in the *Boston News-Letter* of September 12, 1723: “Delegates from several Nations of Indians were Entertained with the sight of a Gun which has but one Barrel and one Lock,” but fired “Eleven Bullets successively in about Two Minutes” after being loaded only once. This firearm was made by John Pimm, a Boston gunsmith, who was active in the 1720s, but had died by 1730. This gun was not being offered for sale; no examples of a repeating long-arm by Pimm survive; it was a novelty. There is, however, a six-shot revolver with a flint ignition system made by John Pimm in the collection of the Cody Firearms Museum at the Buffalo Bill Center of the West.<sup>40</sup>

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<sup>40</sup> John Pimm’s 1715 revolver with a hand rotated cylinder and flint priming system bears an apparent resemblance to a modern Smith & Wesson .38 caliber revolver. Brown, *Firearms in Colonial America*, 255-256. Cut into the rotating cylinder were six chambers into which a small amount of gunpowder and a ball could be placed. The shooter rotated by hand the cylinder to align one of the chambers with both the barrel and firearm’s hammer which held a flint. The shooter then slid open the priming vent on the cylinder for the chamber aligned with the hammer and the barrel. He then pulled back the hammer by hand. Finally, pulling the trigger caused the hammer to strike the metal frizzen with the flint, creating a flash which entered the open vent on the cylinder and set off the powder in the chamber and discharged the ball. To fire again, the shooter again rotated by hand the cylinder to align a loaded chamber with the barrel and hammer and repeated the process outlined above. Pimm’s pistol could deliver six shots after being loaded once, but it was not a rapid-fire weapon, and it took time to reload the individual chambers with powder and ball.

Similar pistols and long arms with revolving cylinders moved by hand first appeared in Germany between 1490-1530. Brown, *Firearms in Colonial America*, 50. However, they remained rare in the American colonies, expensive, and suffered from mechanical problems because of the inability of gunsmiths to fit together the moving parts with enough precision to prevent loose powder from jamming the cylinder or producing an accidental discharge of the six chambers simultaneously. Brown, *Firearms in Colonial America*, 50-51; Graeme Rimer, et al., *Smithsonian Firearms: An Illustrated History*, (New York: D. K. Publishing 2014), 56. The revolver patented by Samuel Colt in 1836 and produced in his factory in Paterson, New Jersey

24. The next reference in an American newspaper to a repeating firearm is contained in an advertisement in the March 2, 1730 issue of Boston's *New-England Weekly Journal*. It was for a firearm employing an uncertain type of mechanism that made it possible to fire a succession of twenty projectiles "at once Loading." This advertisement also makes clear the novelty of such a repeating firearm. Samuel Miller, a Boston gunsmith, was charging Boston residents 9 pence each just to see the gun and 2 shillings—the equivalent of a day's wage of unskilled labor—to see it fired. Basically, this gun was being used in an eighteenth-century version of a sideshow. There is no indication that Miller was producing or selling such firearms.

25. However, in the *Boston Gazette* for April 12, 1756, gunsmith John Cookson advertised for sale a gun capable of firing 9 bullets in rapid succession. It was "A handy Gun of 9 and a half Weight; having a Place convenient to hold 9 Bullets, and Powder for 9 Charges and 9 Primings; the said Gun will fire 9 Times distinctly, as quick, or slow as you please, which one turn with Handle or the Said Gun, it doth charge the Gun with Powder and Bullet, and doth prime and shut the Pan, and cock the Gun." The advertisement provides a spot-on description of three repeating firearms found in the collections of the Milwaukee Public Museum, Royal Armouries Museum in Leeds, and the Victoria and Albert Museum in London that were all produced sometime around 1690 by John Cookson, an English gunsmith.<sup>41</sup> These were expensive and heavy firearms that weighed about 9 and a half pounds unloaded and over 10 pounds when loaded with 9 balls and powder charges.

26. Cookson's English repeater employed what was known as the Lorenzoni breech-loading system.<sup>42</sup> This system placed at the breech-end of the barrel a complex and delicate

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employed percussion caps in its priming system and remains the first practical revolver to enter production. The cylinder rotated when the gun was cocked and fired when the trigger was pulled. However, even sales of this mechanically successful firearm were insufficient to prevent the bankruptcy in 1843 of Colt's first gun manufactory. See Peterson, *Treasury of the Gun*, 211.

<sup>41</sup> Brown, *Firearms in Colonial America*, 144-146; David S. Weaver and Brian Goodwin, "John Cookson, gunmaker," *Arms & Armour*, Vol. 19 (June 2022), 43-63.

<sup>42</sup> Sometime around 1660 Michele Lorenzoni, a Florentine gunmaker, produced a repeating flintlock firearm that employed a lever system to feed into the breech powder and shot. His firearm drew upon earlier versions of this system developed by Giacomo Berselli, another Italian gunsmith, who had built upon earlier innovations by gunsmiths, Peter and Mathias Kaltoff. Brown, *Firearms in Colonial America*, 105-107, 144-145; Peterson, *Treasury of the Gun*, 229-231.

gunlock operated by a handle or lever attached to the left side of the lock. Separate tubes in the stock of the firearm were filled with priming powder, gunpowder for each charge, and 9 to 11 balls. The shooter pointed the gun barrel towards the ground and pushed the handle or lever down and forward, which rotated a mechanism located inside the gun lock that simultaneously brought forward one ball, enough gunpowder to discharge it, and enough primer to set off the charge in the barrel when the trigger was pulled. To recharge and again fire the gun, the shooter again pointed the barrel towards the ground, pushed on the lever and then pulled the trigger. If the parts of the gun lock did not fit tightly or if the shooter failed to lock it in the proper position when firing, flame might leak back and explode the black powder stored in the butt. Catastrophic failures happened because the period's methods of fabrication were not reliably capable of producing the fitting precision parts needed to prevent such malfunctions caused by errant sparks.

27. S sometime before 1701, John Cookson moved to Boston.<sup>43</sup> Despite Cookson's exceptional skill as a gunsmith, he apparently stopped making repeating firearms during his 60 years in Boston. There are no surviving eighteenth-century, American-made Cookson repeaters.<sup>44</sup> This is actually not surprising given the fact that American-made guns were typically "utilitarian in nature, certainly nothing like the fine magazine breech-loading repeaters normally associated with the name John Cookson."<sup>45</sup> The authors of a recent essay speculate that the 1756 newspaper advertisement "could have involved one of the repeaters which he had brought from England when he emigrated and which, at his age of 82 at the time, he had decided to sell."<sup>46</sup> The four known firearms that John Cookson did make in America are different types of single-shot firearms: one is a breech-loader, the others are muzzle-loading.<sup>47</sup>

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Today this type of repeating firearm is generally identified by English and American collectors and curators as employing the Lorenzoni system.

<sup>43</sup> Weaver and Godwin, "John Cookson, gunmaker," 51-56, 59-61

<sup>44</sup> *Ibid.*, 56, 60. Weaver and Godwin make clear that the firearm referred to as a "Volitional Cookson Repeating Flintlock" in the collection of the National Firearms Museum in Washington, D.C. was made in the late 1600s by John Shaw, a London gunsmith.

<sup>45</sup> *Ibid.*, 55.

<sup>46</sup> *Ibid.*, 60.

<sup>47</sup> *Ibid.*, 56-57.

28. The next appearance of an identifiable repeating firearm dates to April of 1777 and comes from the records and correspondence of the Continental Congress. Joseph Belton wrote to the Continental Congress claiming that he had a method “wherein a common small arm, may be maid [sic.] to discharge eight balls one after another, in eight, five or three seconds of time.”<sup>48</sup> He also claimed that such a gun could be made to discharge “sixteen or twenty, in sixteen, ten or five seconds.”<sup>49</sup> Its stated range was a mere 20 to 30 yards. On July 10, 1777, Belton demonstrated a firearm that successively discharged 16 bullets. He also claimed that this weapon could “do execution [at] 200 yards” which would have been a dramatic—and somewhat inexplicable—increase in the weapon’s supposed range of 20 to 30 yards.<sup>50</sup> In any event, Belton and Congress failed to agree on a financial arrangement. Belton requested the princely sum of £13,000—£1000 from each of the 13 states—to compensate him for inventing this system, though he subsequently reduced his demand to only £500 from each of the states.<sup>51</sup> There is no documentary or physical evidence indicating that Belton produced any of these firearms in 1777.

29. The specific design of the firearm that Belton demonstrated in 1777 remains unclear. There is a brass-barreled, flintlock fusil in the collection of the Smithsonian Institution that has been proposed as the actual gun or a prototype for the gun that Joseph Belton demonstrated in 1777.<sup>52</sup> It is engraved “IOS. BELTON INVENTOR ET ARTIFEX – PHILAL-

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<sup>48</sup> Quoted in Brown, *Firearms in Colonial American*, 317. This letter and others are reproduced in their entirety at Joseph Belton to the Continental Congress, April 1, 1777 at “Correspondence between John [sic.] Belton and the Continental Congress” at [https://en.wikisource.org/wiki/Correspondence\\_between\\_John\\_Belton\\_\[sic.\]\\_and\\_the\\_Continental\\_Congress](https://en.wikisource.org/wiki/Correspondence_between_John_Belton_[sic.]_and_the_Continental_Congress).

<sup>49</sup> *Ibid.*

<sup>50</sup> Letter with Enclosure, Joseph Belton to the Continental Congress, July 10, 1777, at “Correspondence between John [sic.] Belton and the Continental Congress” at [https://en.wikisource.org/wiki/Correspondence\\_between\\_John\\_Belton\\_\[sic.\]\\_and\\_the\\_Continental\\_Congress](https://en.wikisource.org/wiki/Correspondence_between_John_Belton_[sic.]_and_the_Continental_Congress).

<sup>51</sup> Joseph Belton to the Continental Congress, May 7, 1777 and Joseph Belton to John Hancock, May 8, 1777 at [https://en.wikisource.org/wiki/Correspondence\\_between\\_John\\_Belton\\_\[sic.\]\\_and\\_the\\_Continental\\_Congress](https://en.wikisource.org/wiki/Correspondence_between_John_Belton_[sic.]_and_the_Continental_Congress).

<sup>52</sup> Robert Held, “The Guns of Joseph Belton Part I” *American Rifleman* (March 1987), 36-39, 68-69; *Oregon Firearms Federation v. Brown*, U.S. Dist. Ct. Civ. No. 2:22-cv-01815-IM (lead case), Declaration of Ashley Hlebinsky (ECF 72) at 18, n 24.

MDCCLVIII [i.e. 1758]”. An additional engraving on the gun refers to “CAPT JOSEPH BELTON OF Philad.”<sup>53</sup> However, the Joseph Belton who arrived in Philadelphia in 1775 and who came into contact with Benjamin Franklin and subsequently other members of the Continental Congress and the Continental Army was a 1769 graduate of the College of Rhode Island, which is today Brown University.<sup>54</sup> In 1758, this Joseph Belton was not in Philadelphia; he was not a captain; and he was not then a gunsmith. Despite claims to the contrary, it is unlikely that this particular gun was demonstrated in Philadelphia in July of 1777.<sup>55</sup>

30. However as Harold Peterson suggested many years ago, it is quite likely that the firearm demonstrated in 1777 employed some version of what is known as a superimposition system.<sup>56</sup> In the simplest version of a superimposed or superposed system of loading a firearm, a series of alternating powder charges and balls are loaded directly into a gun’s barrel. There is no detachable or integral magazine, just a standard barrel that is loaded from the muzzle in an alternating sequence of gunpowder and balls. All of these charges were—ideally—set off in order from front to back by igniting the powder charge located behind the ball closest to the muzzle of the gun’s barrel. There is no magazine involved, and the ensuing discharge of balls is uncontrolled after it is initiated.

31. The superposed system for discharging a succession of balls had been tried as early as 1580 by a German gunsmith working in London.<sup>57</sup> Today, early flintlock pistols that used a simple superposed loading system are sometimes referred to as “Roman candle pistols” because they employed “the same principle as the firework” which involves setting off “a chain

<sup>53</sup> Smithsonian National Firearms Collection, [https://americanhistory.si.edu/collections/search/object/nmah\\_440031](https://americanhistory.si.edu/collections/search/object/nmah_440031) Accessed 2/2/2013.

<sup>54</sup> Benjamin Franklin to Silas Deane, August 27, 1775 in *Papers of Benjamin Franklin*, Vol. 22, 183-185, especially footnote, 2.

<sup>55</sup> Quite distinct from the questions raised by what is known of Joseph Belton’s biography is the claim in Adam Weinstein “I am Tired of Being Tired” December 21, 2018 that his grandfather, Kenneth Weinstein, a gunsmith, fabricated this particular firearm. adamweinstein.substack.com/p/i-am-tired-of-being-tired <Accessed 2/2/2023 at 12:00PM>.

<sup>56</sup> Peterson, *Arms and Armor in Colonial America*, 218.

<sup>57</sup> Peterson, *Treasury of the Gun*, 195.

reaction of multiple discharges.”<sup>58</sup> Other writers also liken flintlock long arms that employed a simple superposed system of multiple charges to “Roman candles”.<sup>59</sup>

32. Later in London, Joseph Belton was involved in producing a sophisticated and controllable version of a firearm employing a superposed system. In 1784, Belton went to England where he failed to interest the English Ordnance Department in some version of his superposed system. By 1786, he had entered into a partnership with London gunsmith William Jover (active 1750-1810). Together they produced for Britain’s East India Company a smoothbore repeating firearm with a sliding gunlock, that moved down the barrel to ignite a succession of powder charges that propelled a series of musket balls contained in a replaceable metal magazine holding 7 projectiles. There are two authentic examples of this particular firearm in the collection of the Royal Armouries, National Firearms Center in Leeds, England.

33. Belton’s 1786 firearm allowed the shooter to control the weapon’s discharge and aim each shot, which was not possible with the simpler superposed system. As the 1786 firearm’s moving gunlock lined up with the next powder charge and ball, the shooter primed a pan, pulled back the cock on the sliding gunlock, and then pulled a trigger firing off a single projectile. Because of the need to cock and prime each time before pulling the trigger and firing the gun, this was not a rapid-fire repeating arm. This firearm was also something of a challenge to handle. It weighs 10 pounds unloaded and would have weighed close to 11 pounds when loaded. Jonathan Ferguson, the Keeper of Firearms and Artillery at the Leeds Firearms Center observes in an on-line video that managing the weapon is “a bit of a three-handed job.”<sup>60</sup>

34. A much cruder version of a firearm employing a superposed system was produced in America in the early 1790s. A July 20, 1793 newspaper report in *Philadelphia’s Gazette of the United States* from Elizabeth Town, Pennsylvania describes a firearm created by “the ingenious and

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<sup>58</sup> Jeff Kinard, *Pistols: An Illustrated History of their Impact* (Santa Barbara, CA: ABC-CLIO, 2004), 37.

<sup>59</sup> Brown, *Firearms in Colonial America*, 100; Peterson, *Treasury of the Gun*, 197.

<sup>60</sup> Jonathan Ferguson, “Flintlock Repeating – 1786” youtube.com/watch?v=-wOmUM40G2U. <Accessed online 11/6/2022 at 4:00 P.M>

philosophic Mr. Chambers of Mercersburg in Pennsylvania.” This was Joseph Gaston Chambers (1756-1829). According to the news report, this pistol “discharged six balls in succession, with only one loading and once drawing the trigger, exclusive of the reserve shot, which went off with the drawing of another trigger.” Later in the year, Chambers attempted to interest the United States War Department in buying long arms employing his version of the superposed system.

35. A drawing that was probably done later reveals that Chambers’s superposed system for a musket employed two gunlocks: one near the front of the barrel and the other in the usual location at the barrel’s breech. First a powder charge was poured down the barrel followed by a traditional spherical ball which was pushed down to the breech. This was the reserve shot. Next a succession of 8 special, cylindrically shaped bullets with conical tails and 8 powder charges were pushed down the barrel. Pulling a cord triggered the lock near the front of the barrel and ignited the first powder charge closest to the muzzle, which fired the first cylindrical projectile. A hole in the next projectile carried the charge through it and down its conical tail, which ignited the charge, which propelled the second cylindrical charge, and so on. Finally, the spherical ball resting at the barrel’s breech was discharged by pulling the second trigger near the breech.<sup>61</sup> Chamber’s system did not employ a detachable magazine, and once initiated, the gun’s discharge could not be controlled. A drawing of this firearm is attached as **Exhibit B**.

36. Chambers’s initial efforts to win government interest in 1793 and a patent for his invention were unsuccessful. A demonstration in May of 1793 failed to impress the War Department. Later in 1813, Chambers did secure a patent and supplied the U.S. Navy with 200 repeating muskets and 100 repeating pistols and also sold weapons to the state of Pennsylvania.<sup>62</sup> The Navy’s use of these weapons attracted the attention of the British and Dutch governments. However, in the end, Chambers’s system with its unusual projectiles failed to obtain sustained interest from any government. His guns did work, but they could also produce devastating malfunctions. As historian Andrew Fagal has pointed out, cramming the gun’s barrel with

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<sup>61</sup> For the best description of the system and an illustration of how the gun was loaded see Fagal, “The Promise of American Repeating Weapons, 1791-1821” pages 2-3 of 6.

<sup>62</sup> Peterson, *Treasury of the Gun*, 197.

projectiles and gunpowder produced what was potentially a pipe bomb.<sup>63</sup> All superposed weapons were difficult to load correctly, and if the bullets did not fit tightly, flame could leak around them and set off all the charges at once.<sup>64</sup> In the 1820s, the “complexity and inherent dangers” of superposed systems that filled gun barrels with multiple charges of explosive gun powder “led to their wholesale abandonment.”<sup>65</sup>

37. A safer alternative to the systems employed by Cookson and Chambers was an air gun that did not use black powder as a propellant. There are two advertisements—one for a demonstration and one for an auction—that contained references to an air gun able to fire 20 times with a single charging. The February 10, 1792, issue of New York City’s *Daily Advertiser* announced “To the Curious” daily exhibitions of an air gun. This gun was supposedly made by a young man who was a native of Rhode Island, though in an advertisement almost two years later, it was claimed that the gun was made in New York City by “An American Artist.” This gun discharged twenty times without needing to renew the propellant provided by compressed air. Each pull of the trigger provided enough air to send a ball through an inch-thick board at a distance of sixty yards. For 6 pence, a resident of the city could see Gardiner Baker demonstrate the air gun twice a day—Tuesday and Friday afternoons excepted—at his museum located at no. 13 Maiden Lane. There is no indication that Gardiner Baker, “the young man in Rhode Island” or the “American Artist” in New York was marketing air guns. Instead, once again a repeater was being featured as a novelty in a show put on for paying customers.

38. The air gun demonstrated by Baker appears to have resembled or possibly might have been an actual example of a European air rifle designed by Bartholomeo Girardoni in 1779. A Girardoni air gun had a magazine with a capacity of 22 balls, each of which was propelled by discharges of compressed air from a replaceable cannister carried in the gun’s stock. The gun

<sup>63</sup> Fagal, “The Promise of American Repeating Weapons, 1791-1821,” page 4 of 6.

<sup>64</sup> Peterson, *Treasury of the Gun*, 198.

<sup>65</sup> Andrew J. B. Fagal, “The Promise of American Repeating Weapons, 1791-1821” page 2 of 6. <Accessed online 10/25/2022 at 4:55 P.M> Fagal is currently an assistant editor of the Papers of Thomas Jefferson at Princeton University.

weighed about 10 pounds—which was about the same as a musket—but was shorter, being only four feet in length overall. As contemporaries in Europe reported, these air guns were not without their problems: “Due to their construction, these guns were much more difficult to use effectively than normal, as one had to handle them much more cautiously and carefully.”<sup>66</sup> In the late 1700s, the Austrian Army, which had a peacetime establishment of 304,628 men, purchased 1,500 Girardoni air rifles that, theoretically, could have armed only 0.5% of its soldiers.<sup>67</sup> As it turned out, “after a while no more than one-third of them were in a usable state,” and they were all phased out by 1810 if not before.<sup>68</sup>

39. The American military’s use of a Girardoni air rifle was more limited in number and briefer in its timespan, but is also much better known. On their 1804-1806 expedition to the Pacific Ocean and back, Lewis and Clark and their “Corps of Discovery” carried with them a single Girardoni air rifle.<sup>69</sup> While it was occasionally used for hunting, their air rifle was primarily employed to impress Natives that they encountered along the way. As Private Joseph Whitehouse recorded in his journal: “Captain Lewis took his Air Gun and shot her off, and by the Interpreter, told them that there was medicine in her, and that she could do very great execution.” “They all stood amazed at this curiosity.”<sup>70</sup> Eight decades after John Pimm’s repeating firearm had been used to impress Native Americans in Boston, Lewis and Clark—like the showman Philadelphia Gardiner Baker—were still able to exploit the rarity of a repeating gun to awe and entertain.

40. It is possible that someone in the United States may have been marketing Girardoni air rifles or something very similar to them in the mid-1790s. An announcement for a public

<sup>66</sup> Quoted in Frederick J. Chiaventone, “The Girardoni Air Rifle: The Lewis and Clark Expedition’s Secret Weapon” *Military Heritage* Vol. 14 No. 5 (January 2015), 19.

<sup>67</sup> Richard Bassett, *For God and Kaiser: The Imperial Austrian Army* (New Haven: Yale University Press, 2015), 186.

<sup>68</sup> Chiaventone, “Girardoni Air Rifle,” 19.

<sup>69</sup> For the identification of the air rifle on the Lewis and Clark Expedition as a Girardoni see Madeline Hiltz, “The Lewis and Clark Air Rifle: A Blast from the Past” *War History on Line* (June 16, 2021) <https://warhistoryonline.com/war-articles/lewis-and-clark-air-rifle.html?firefox=1> <Accessed online 1/21/2023, 8:00AM>

<sup>70</sup> Chiaventone, “Girardoni Air Rifle,” 66.

auction in the issue of the Boston *Columbian Sentinel* for March 7, 1795 listed among the items to be sold “a Magazine Air-Gun, equipped for hunting, and will carry ball or shot.” This air gun appears to be a repeating gun because of its reference to a “Magazine.” However, one should not automatically assume that all early air guns were repeaters. Air rifles made by Isaiah Lukens (1779-1846) of Pennsylvania were single shot air guns, though some writers erroneously assume that they were repeaters like Girardoni’s air rifle.<sup>71</sup> It wasn’t until the 1880s that two Michigan companies—the most famous of which was the Daisy Manufacturing Company—would begin marketing the first commercially successful, mass-produced repeating air rifles, aiming them at a youth market, employing a lever-action operating system, and shooting BB-caliber pellets.

41. Two more references to what appear to be repeating firearms were discovered in eighteenth-century newspapers. One from the August 19, 1793 issue of the Concord, New Hampshire *Mirrour* contains a vague report of a repeating weapon supposedly designed by an “Artist in Virginia”. However, this particular news report has been dismissed as a fabrication.<sup>72</sup> The other reference to what does appear to be an identifiable type of repeating firearm was contained in a large advertisement in the October 26, 1785 issue of the *Columbian Herald* in Charleston, South Carolina. It was placed by James Lambet Ransier, a native of Liege, which was a center of small arms manufacturing in the Low Countries. Ransier announced that he had “a beautiful and complete assortment of Firearms” and in particular, he could furnish guns “that will fire four different times, with only charging once; or, if the person pleases, he may fire four different times one after another, with only one single lock.”

42. Ransier appears to be describing imported Belgian or French-made Segales pistols which had four rifled barrels. These were small pistols that had a box lock and a swiveling

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<sup>71</sup> Nancy McClure, “Treasures from Our West: Lukens Air Rifle” August 3, 2014, Buffalo Bill Center of the West. <Accessed online on 10/31/2022, at 10:40 A.M> On November 2, 2022, I received an email from Danny Michael, Curator of the Cody Firearms Museum at the Buffalo Bill Center of the West, confirming that their Lukens air rifle is a single shot weapon.

<sup>72</sup> Many aspects of the news report in the *Mirrour* raise fundamental questions about its believability, as does the fact that it was immediately followed by a news report on a Sea Monster. An intensive search of Virginia newspapers in *America’s Historical Newspapers* failed to uncover the supposed origin of the news report. Because it could not be confirmed and because of its lack of detail and credibility, the report was dismissed.

breech attached to a cluster of four separate barrels: two upper barrels placed on top of two lower barrels. The box lock had two triggers and two hammers holding two flints, while the swiveling or rotating breech had four frizzens that were attached to the barrels. Each barrel was loaded separately at the muzzle with powder and ball. The two upper barrels could be fired one at a time by pulling each of the individual triggers in succession or fired simultaneously by pulling both triggers at once (which could be risky). After discharging the two upper barrels, the shooter then swiveled the rotating breech and the cluster of four barrels by pulling on the pistol's trigger guard. Once rotated to the upper position, the two barrels formerly in the lower position could now be fired when the triggers were pulled individually or simultaneously. However, as experts have pointed out: "All revolvers, and other multibarrel guns, of the muzzle-loading type were at risk from a dangerous chain reaction, in which firing one chamber could accidentally set off all the others."<sup>73</sup> If this happened, the gun would explode in the shooter's hand.

43. Finally, something needs to be said about a gun which—ironically—was never found in the 13 Colonies, but has assumed an out-sized importance in the minds of some writing about colonial Americans and their presumed interest in and familiarity with repeating firearms.<sup>74</sup> In the early 1700s, James Puckle, an English lawyer, writer, and part-time inventor created a firearm fed by a 11-shot magazine located at the back of the gun that was rotated by a crank. Rotating the crank aligned a power charge and bullet in the magazine with the weapon's barrel. After locking the magazine and the barrel together, the operator had to manually prime each shot and pull back the cock before pulling the trigger for each discharge of the weapon. Because of the time needed to prime and cock the hammer before each shot and to change the magazine after it was emptied, the gun had a rate of fire of only 9 rounds per minute. It was

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<sup>73</sup> Rimer, *Smithsonian's Firearms*, 56.

<sup>74</sup> Clayton E. Cramer and Joseph Edward Olson, "Pistols, Crime, and Public Safety in Early America" *Willamette Law Review* Vol. 44. No. 4 (Summer 2008), 716-717; David B. Kopel, "The History of Firearm Magazines and Magazine Prohibitions" *Albany Law Review* Vol. 78, No. 2 (2014-2015), 852.

never used in battle. The company producing it went out of business before 1730. This gun had no discernable impact on colonial Americans nor on the development of firearms technology.<sup>75</sup>

44. However, the Puckle gun lives on in the imaginations of some.<sup>76</sup> Because of its weight, the Puckle gun used a tripod. Visually the weapon bears an undeniable physical resemblance to certain .30 caliber machine guns used in World War II. As a result, some refer to it today as “an eighteenth-century machine gun.” It was not a machine gun as we understand and use the term today, in either its mode of operation or its rate of fire. The machine gun, invented by Hiram Maxim in 1884, used the recoil action of the gun to load it continuously and discharge spent cartridges. Just pull the trigger and it kept firing bullets as long as the operator’s assistant kept feeding it an ammo belt. Another less common version of the machine gun diverted some of the gasses produced by discharging the weapon into a tube with a piston that automatically and repeatedly loaded the gun and ejected spent cartridges. (A modern assault rifle uses a similar system that also employs diverted gasses to operate a piston.) The .30 caliber medium machine gun used by the American army during World War II fired approximately 500 rounds a minute. The only thing this weapon had in common with the eighteenth-century Puckle Gun was its use of a tripod.

45. In summary, period probate inventories and newspapers indicate that repeating firearms were extraordinarily rare in eighteenth-century America. Like muskets, repeaters were regarded as military firearms. In 1777, the Continental Congress demonstrated an interest in Joseph Belton’s firearm, and in 1813 the United States Navy purchased 200 muskets and 100 pistols produced by Joseph Gaston Chambers. However, such superposed systems were in the assessment of military historian Joseph G. Bilby “a developmental dead end.”<sup>77</sup> Well into the third-quarter of the nineteenth century, the American government armed the overwhelming

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<sup>75</sup> Brown, *Firearms in Colonial America*, 239. Brown appears to misstate the capacity of the magazine as 9-shot, when it was actually a 11-shot magazine.

<sup>76</sup> See note 74 above.

<sup>77</sup> Joseph G. Bilby, *A Revolution in Arms: History of the First Repeating Rifles* (Yardly, Penn.: Westholme Publishing, 2015), 41.

majority of its soldiers with muzzle-loading single-shot long arms. Even during the Civil War, the Union army made only limited use of the much more reliable repeating long arms made by Samuel Colt, the Spencer Arms Company, and the New Haven Arms Company, which was owned by Oliver Winchester and produced a repeater designed by Benjamin Henry.<sup>78</sup>

46. The earlier lack of enthusiasm for repeating firearms among eighteenth-century Americans is unsurprising given the colonists' demonstrated preferences for inexpensive, light firearms that used less gunpowder and lead than did muskets. By contrast, most of the period's repeating arms were expensive, heavy, and required greater expenditures—that were often uncontrollable—of gunpowder and lead. Because repeating firearms contained multiple charges of explosive black powder gunpowder, they were also more dangerous than a gun using a smaller charge of gunpowder and a single projectile. Some of these repeating firearms had the potential to turn into a Roman candle or a pipe bomb. As Harold Peterson has observed "As long as the powder and ball had to be loaded separately there was no hope for a simple and safe magazine repeater."<sup>79</sup> For these reasons, eighteenth-century advertisements and homes were filled with muzzle-loading, single shot firearms.

47. The fact that some repeating firearms had been produced in Europe for four centuries by 1800 does not necessarily support the conclusion that Americans in the late 1700s would have assumed that such weapons would inevitably become reliable, safe, and widely available. An individual looking back from 1800 might have been just as likely to conclude that very little progress had been made over the previous four centuries. It was still not possible to manufacture with precision and in any quantity firearms with closely fitting parts that could contain the destructive explosive potential associated with the use of black powder gunpowder. The superposed systems employed by Belton and Chambers, the Girardoni air rifle, and the Puckle Gun proved to be dead ends. Calling these weapons and others like them "eighteenth-century assault rifles" or "an eighteenth-century machine gun" are examples of modern-day

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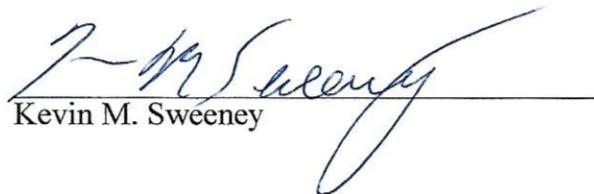
<sup>78</sup> Bilby, *Revolution in Arms*, 44-48, 60-91.

<sup>79</sup> Peterson, *Treasury of the Gun*, 233.

rhetoric, not evidence of inevitable developments in firearms technology. As George Basalla, an historian of technology, has cautioned: "All too often it is assumed that the development of technology is rigidly unilinear."<sup>80</sup>

I hereby declare that the above statement is true to the best of my knowledge and belief, and that I understand it is made for use as evidence in court and is subject to penalty for perjury.

Dated this 5 day of February, 2023.



The image shows a handwritten signature in blue ink, which appears to read "Kevin M. Sweeney". Below the signature, the name "Kevin M. Sweeney" is printed in a smaller, black, sans-serif font.

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<sup>80</sup> George Basalla, *The Evolution of Technology* (New York: Cambridge University Press, 1988), 189.